

SMARA UPDATE

The Quarterly Newsletter of the Department of Conservation, Office of Mine Reclamation



OMR Launches New Lead Agency Review Program

In an effort to help lead agencies meet their responsibilities under the Surface Mining and Reclamation Act (SMARA) and improve compliance by surface mine operators, the Office of Mine Reclamation (OMR) is implementing a new review program for all SMARA lead agencies. The program will include, among other things, a compilation and review of available SMARA documentation, an evaluation of lead agency compliance with procedural requirements of SMARA and its implementing regulations, and an evaluation of lead agency SMARA inspection processes. The review program may also highlight areas where increased technical assistance by OMR could help lead agencies meet their SMARA responsibilities and, by extension, improve overall compliance by surface mine operators.

The review program will be tailored to fit the unique characteristics of each lead agency, but the overall approach will be the same in each case. OMR will work with the lead agency to identify all available mining permits, reclamation plans, interim management plans, financial assurance cost estimates, financial assurance mechanisms, annual inspection reports, and enforcement-related documentation for each surface mining operation within its jurisdiction. Copies will be requested of all identified documents that are not currently in OMR's files. With this information,

OMR will evaluate the lead agency's performance of procedural requirements of SMARA, such as conducting annual inspections of surface mining operations, requiring proper submission and annual adjustment of financial assurances, and requiring operators of idle surface mining operations to submit interim management plans or commence reclamation activities.

The next phase will be an evaluation of the lead agency's performance of annual mine inspections. Based on information developed earlier in the review, OMR will request joint lead agency/OMR site visits to selected surface mining operations. These site visits will

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Overcoming the Challenges of Desert Revegetation - Part II

(This article is a continuation from the Summer 2006 issue of the SMARA Update, which can be found online at <http://www.consrv.ca.gov/omr/smara/newsletter/Spring2006.pdf>.)

Soil Amendments

The addition of amendments and mulches to salvaged and redistributed topsoil may increase germination and plant establishment in any ecosystem, especially deserts. Mulches add organic matter to the soil, increase rainfall infiltration and retention, reduce evaporation and plant transpiration, decrease competition from weeds, and generally improve the soil and the microclimate around the plant. For desert applications, choose a type of mulch that is composed of large pieces or of heavier materials: these will deteriorate more slowly and be more wind resistant than lighter materials. Soil shaping techniques that create depressions will also trap blowing silt, seed, and plant materials, adding to the accumulation of mulch.

Desert soils are often low in nutrients and a laboratory soil analysis may recommend the application of fertilizer. However, the addition of fertilizers tends to promote invasive exotic plants, which can reduce native plant establishment and survival. Therefore, fertilizers are often unnecessary. When they are used, they should be of a low-potency, slow-release type.



OMR botanists measure the success of creosote bush, four-wing saltbush, and other desert perennials in these "flower pots" created by sculpting the land at this reclaimed gold mine.

Plant Materials

Due to unpredictable, infrequent precipitation, plant establishment and growth is slow and sporadic in arid ecosystems. Plant density and cover are usually low and shrubs are usually the dominant life form. Seeds of most native desert plants are long-lived, able to take advantage of favorable conditions for germination once they do occur. A wet winter can send forth a burst of growth and colorful annual wildflowers can carpet the otherwise barren desert floor.

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Taking these conditions into account, it is reasonable to assume that achieving your revegetation success criteria may take longer in the desert than in other environments – perhaps up to ten years. One restoration specialist speaking at the “Mojave Desert Revegetation Symposium,” held in Las Vegas this past April, stated that good plant growth could only be expected on an average of one out of every three years. This means that revegetation will require patience and long-term monitoring. Temporary irrigation can speed up the process, but is often impractical on large desert mine sites. Setting realistic targets should be tied to baseline surveys conducted in undisturbed habitats near the mine site. Targets for cover, density, and species richness can be set at about one-third of baseline numbers. Different targets should be set for different site conditions, such as north versus south facing slopes versus desert wash. A high rate of seeding (measured in PLS - Pure Live Seed - per acre) and a wide variety of local species should be used to help ensure success. Seed collection should begin early, since seed production will also vary from year to year.

Only perennial species can be used in measuring success, since annuals are ephemeral and highly variable from year to year. However, this does not imply that your seed mix should be comprised exclusively of perennials. Annuals, such as desert plantain (*Plantago ovata*), are important components of seed mixes, especially for erosion control. Grasses and forbs can provide needed cover while the slower-growing shrubs are getting established. Some desert plants, such

as cacti, succulents, and yuccas, such as Joshua trees, can be salvaged and transplanted if the correct procedures are carefully followed.

And, unfortunately, arid ecosystems are not immune to invasion by exotic weeds. Among the major problem weeds to be on the alert for in the Mojave region are Russian thistle or “tumbleweed” (*Salsola tragus*), Sahara mustard (*Brassica tournefortii*), cheat grass (*Bromus tectorum*), and salt cedar or tamarisk (*Tamarix ramosissima*).



Desert Mallow (*Sphaeralcea ambigua*) is a great choice for revegetation because it naturally colonizes disturbed areas such as this hillside that had burned in the large fires that swept through the Mojave last summer.

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DESERT REVEGETATION (Continued from page 3)**SOME PLANTS FOR MOJAVE DESERT REVEGETATION**

Common name	Latin name
SHRUBS and SUB-SHRUBS:	
Creosote bush	<i>Larrea tridentata</i>
Saltbush (many species)	<i>Atriplex</i> spp.
Burro-weed	<i>Ambrosia dumosa</i>
Brittlebush, Incensio	<i>Encelia farinosa</i>
California buckwheat	<i>Eriogonum fasciculatum</i>
Cheesebush	<i>Hymenoclea salsola</i>
Brickelbush	<i>Brickellia</i> sp.
Goldenbush	<i>Ericameria</i> sp.
Sweetbush	<i>Bebbia juncea</i>
Mojave Croton	<i>Croton californicus</i> var. <i>mohavensis</i>
GRASSES and HERBS:	
Six-week fescue	<i>Festuca octoflora</i>
Big galleta	<i>Pleuraphis rigida</i>
Indian ricegrass	<i>Acnatherum hymenoides</i>
Purple three-awn	<i>Aristida purpurea</i>
Alkali sakaton	<i>Sporobolus airoides</i>
Fluff grass	<i>Erioneuron pulchellum</i>
Desert plantain	<i>Plantago ovata</i>
Arizona lupine	<i>Lupinus arizonicus</i>
Stiff-haired lotus	<i>Lotus strigosus</i>
Freckled milkvetch	<i>Astragalus lentiginosus</i>
Desert mallow	<i>Sphaeralcea ambigua</i>

More information on desert restoration can be found at <http://www.ecocomposite.org/restoration/index.htm>. Another good resource is "A Beginner's Guide to Desert Restoration" by David Bainbridge, et al. at <http://www.mycorrhiza.org/bainbridge.pdf>.

Leah Gardner Miller
Senior Biologist, Botany

UC Davis' Vic Claassen Visits OMR

Victor P. Claassen, Ph.D., is an Assistant Research Soil Scientist with UC Davis' Department of Land, Air, and Water Resources. Over the years, Dr. Claassen has worked with the Office of Mine Reclamation (OMR) on numerous mine reclamation projects and studies. He analyzed the soil conditions at the Spenceville copper mine in Nevada County, conducted a detailed study of the native plants in the area, and developed a soil amendment strategy that OMR used with its revegetation test plots. He co-authored the OMR report: "Rehabilitation of Disturbed Lands in California: A Manual for Decision Making" (available at http://www.consrv.ca.gov/OMR/gh_publications.htm), and he assisted in the publication of OMR's June 2000 report: "California's Abandoned Mines - A Report on the Magnitude and Scope of the Issue in the State."



Dr. Claassen presents a slideshow of his many successful revegetation projects.

In October, Dr. Claassen gave a presentation to OMR staff on his recent revegetation research involving disturbed soils and some of the processes and techniques that can lead to successful revegetation. His research shows that many revegetation projects fail because of unknown problems with the damaged soils or substrates. These conditions remain on a site after a disturbance such as surface mining or the creation of a cut slope. In order to identify the conditions that limit plant growth at these kinds of sites, and to guide the development of appropriate remediation activities, an extensive list of soil conditions must be examined. Soil conditions tested in Dr. Claassen's research include infiltration capacity, water holding capacity, soil organic matter pools, plant available nutrients, microbial activity, and surface mulch protection.

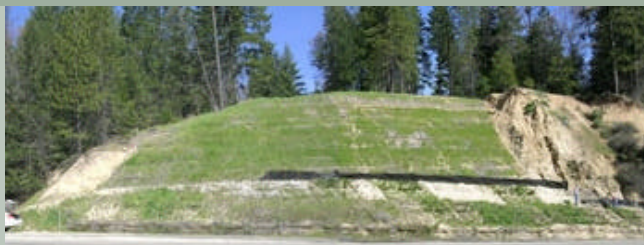
Based on this analysis, disturbed soils may need treatments or amendments to promote plant growth. Once treated, an erosion resistant, native plant cover can be established on the site. According to Dr. Claassen, study sites around the state have demonstrated that plants can establish on the amended sites without the need for supplemental irrigation.

Dr. Claassen will give a similar presentation at OMR's next SMARA workshop, scheduled for January 17-18 in Sacramento.

Successful revegetation of a severely eroded slope



BEFORE



AFTER

New Faces at OMR



The **Abandoned Mine Lands Unit (AMLU)** recently filled two new, two-year limited-term positions. **Craig Turner**, a Research Analyst II, comes to the AMLU from the Department of Fish and Game (DFG), where he spent most of the past 11 years performing mapping and Geographic Information System (GIS) services for that department's Resources Management and Policy Division. While he enjoyed his work at DFG, Craig saw a great opportunity to learn more about California resources, particularly its geology and cultural history, by coming to work for the AMLU.

Craig was born and raised in Southern Australia. He came to California to attend school at UC Davis, and through circumstance, decided to stay. He studied geography and environmental policy at Davis and has a bachelor's degree in geography. He loves California and all it has to offer. He is looking forward to learning more about abandoned mines in California and, of course, getting out into the field!

Environmental Scientist **David Tibor** has a bachelor's degree in environmental biology from UC Santa Barbara. Out of college, he worked in Canada studying waterfowl and wetlands, and for the U.S. Forest Service studying breeding birds in the Sierra. He then spent 12 years with the California Native Plant Society (CNPS) in Sacramento, first as an assistant, and then as the statewide Rare Plant Botanist. His work included pursuing the listing of rare plants under the State and Federal Endangered Species Acts, various conservation efforts, and maintaining a statewide inventory of threatened plants, culminating in the publication of the CNPS *Inventory of Rare and Endangered Plants of California* (6th edition) in 2001.

Dave worked most recently with the Department of Fish and Game's California Natural Diversity Database, updating locations of rare plants in their statewide dataset. An avid backpacker, he took a five-month hiatus from the working world in 2004 to thru-hike the 2,650 miles of the Pacific Crest Trail, from the Mexican border to Canada. His most recent trip was about 230 miles of mostly cross-country, above timberline hiking in the High Sierra this last June and July. At the AMLU, Dave is looking forward to combining his experience with databases, GIS, and statewide inventory efforts with his love of the deserts and mountains of California.



LEAD AGENCY REVIEW PROGRAM *(Continued from page 1)*

help OMR determine whether observed SMARA violations have been identified and accurately reflected in inspection reports. Where violations have been identified, OMR will assess the lead agency's use of its SMARA enforcement powers to achieve prompt compliance by surface mine operators. For violations not previously identified, OMR will consult with the lead agency to determine the steps that should be taken to achieve compliance.

OMR will then review the most recent financial assurance cost estimate for each surface mining operation within the lead agency's jurisdiction. An analysis will be performed of any cost estimate that did not previously receive detailed comment from OMR. A summary of findings will be provided to the lead agency, with the expectation that any issues raised will be addressed in the next annual adjustment of the financial assurance amount. In cases where financial assurances are determined to be substantially inadequate, OMR will consult with the lead agency on the need to require an interim increase in the financial assurance mechanism.

A draft report on the review, including any findings, will then be prepared and discussed with lead agency staff. OMR will provide technical assistance, where needed, to improve the adequacy and effectiveness of its SMARA program. In cases of ongoing noncompliance by surface mining operations, OMR will work with the lead agency to develop a plan and timeline for bringing these operations into compliance. OMR will then issue a final report on the review.

The new program is already under way. SMARA lead agency reviews are currently being conducted for Madera, Sierra, and Orange counties.

OMR sees this new program as an opportunity to improve the technical skills of lead agency staff, highlight areas where improvement is needed, and work collaboratively to resolve SMARA compliance issues. While each review will focus on the performance of an individual lead agency, the overall goal is to ensure the consistent and effective administration of SMARA by all lead agencies and to improve compliance by all surface mining operations.

Douglas W. Craig
Assistant Director, Office of Mine Reclamation

EXAM ANNOUNCEMENT

The Department of Conservation is giving an Engineering Geologist exam for those interested in working for the State of California. The official bulletin, including minimum qualifications to take this exam, can be found at: <http://jobs.spb.ca.gov/openxrd.cfm?exc=6CM24>

The final filing date for this exam has been extended to January 16, 2007. Engineering Geologist positions exist throughout the State of California.

To check on current open exams and job openings with the Department of Conservation, please visit our jobs website at: <http://www.consrv.ca.gov/index/jobs.htm>

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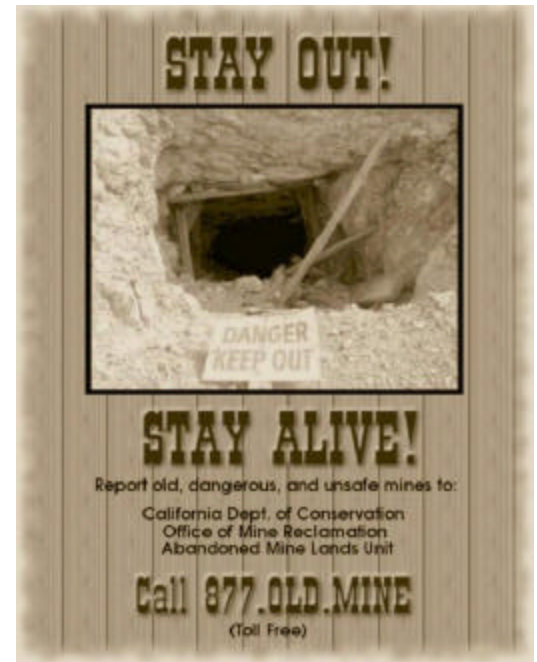
*Department of Conservation
Office of Mine Reclamation
801 K Street, Suite 900
Sacramento, CA 95814
(916) 323-9198*



Our web site address is <http://www.conservation.ca.gov/omr>

The purpose of this publication is to impart the latest reclamation tips as well as changes in SMARA-related legislation or the interpretation of existing statutes by court decisions.

<i>Director:</i>	<i>Bridgett Luther</i>
<i>Assistant Director for OMR:</i>	<i>Douglas W. Craig</i>
<i>Newsletter Editor:</i>	<i>Lynne Taylor</i>



Administrative Penalties Issued to Annual Report Non-Filers

Approximately 280 surface mining operations failed to submit their 2005 Mining Operation Annual Reports and reporting fees by the July 1, 2006 deadline. Late fees and interest charges apply to all annual reports submitted after that date. Reminder letters sent by the Office of Mine Reclamation (OMR) on August 18 and again on October 3 reduced the number of non-filers to 90.

On December 1, 2006, OMR issued notices and orders of administrative penalties to 49 surface mining operations for failure to submit their 2005 annual report. Each order imposes an administrative penalty of \$1,000 and requires the surface mining operation to submit a properly completed 2005 annual report, associated reporting fees, late fees, and interest. Orders setting administrative penalties become effective upon issuance and payment must be made within 30 days, unless the operator petitions the State Mining and Geology Board for review. In early January 2007, OMR will issue notices and orders of administrative penalties to all remaining surface mining operations that have not yet submitted their 2005 annual report.

OMR - Ensuring mined lands are returned to a beneficial end use after mining.